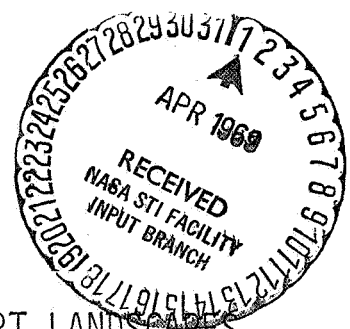


(TRANSLATION)

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## SOIL VEGETATION COMPLEXES OF TUNDRA AND POLAR DESERT LANDSCAPES

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Two particular landscapes are characterized for the dry lands of the Arctic: polar deserts and tundra. Their origins vary. Soil-vegetative cover of the former were joined in the tertiary Bering Arctic on a basis of Alpine vegetation. Polar deserts are homogenous in flora and structure at various parts of the Arctic. Tundra evolved in the Quaternary period at the rim of glaciers of the northern forests, bogs, and inlet meadows enriched by arctic-alpine flora. Their soils and vegetation vary in different parts of the tundra zone depending on the unlike history of modern conditions of nature.

In the formation of polar deserts we notice the complexity and depression of soil-vegetation layers. The complexity, i.e., the regular alternating of overgrown and almost exposed zones are explained by the action of ice, snow drifts, and significant moistening of the soil below the permafrost. On the surface of the ground, from the frost, there forms a network of fissures which are secured and strengthened by the annual freezing of the spring waters in them. The ravines which are formed retain the winter snow and protect soil-vegetation complexes from strong arctic snow drifts of gehistotherm, making use of summer heat from the surface layers of air and the upper layers of soil. Soil-vegetation deposits are compressed in three layers: the subsurface (roots and microorganisms), lichen-moss soil, and grass. In a decayed raised cell of snow abrasion, the soil and vegetative sod is destroyed, and to this is added the action of run-off and protrusions in the surface of ice accretion in the soil. In rocky soil and in frost fissures, rubble is accumulated which is separated from the sand by repeated freezing and thawing of the substrata. In the lowland plains, the landscape climax<sup>1</sup> is presented as a mossy polygonal desert with decayed fragile peaty (turfy) gley soil; in the mountains it changes to a lichen-moss polygonal desert with fragile peaty detritus soil. In the extreme Arctic, probably, the climax is a snowy meadow on almost changeless talos.

Tundras have almost continuous soil-vegetative covers, complex in most drained fields. This complexity is dependent on a system of ravines of frost fissures which are divided by decayed arched zones.

<sup>1</sup> The expression *climax* is used not in the Anglo-American sence; i.e., not as a final constant stage of vegetative development, but only as a separate more stable phase of its development.

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The pressure of spring and glacier wedges in fissures and other local ice accretions in the soil from underground waters sometimes causes protrusions and fractures of layers of turf and soil. Spot formations increase in open slopes under the influence of snow drifts in the winter and overflow saturated with sandy water. Peat-gley tundra soils are well developed and in dried sand there are also weak podzolic soils. To the west of the Taymir, the surface often becomes an area of increased gley floor, and to the west it always returns to a frozen state. The especially stable moist soil in the eastern tundra is explained by the increased condensation of water vapors of the air and the surface of low-temperature permafrost which, to a lesser degree, develops in the west from its less-cold permafrost. The tundra vegetation consists of microtherm and gehistotherm, which are formed underground by lichen-moss soil and scrub-grass floors; to the south there is an even-more scrub-covered floor. On the strength of the local differences, the climax of the younger low tundra of western Siberia, the Atlantic Arctic, and also, probably, the eastern American Arctic has mossy tundra on decayed peaty gley soils. The climax of ancient tundra of eastern Siberia and the western American Arctic are hilly lichen-mossy tundra and peaty gley soils.

The described material differs in structure and history from the development of the polar deserts and the tundra compels one to divide the dry land of the Arctic into two zones with their basic landscape climaxes. In the zone of polar deserts, the soil-vegetative cover under the conditions of severe climate, remained in a primitive stage of development, but in the tundra zone a relative complexity is achieved having been formed in more recent times by means of the degradation of complex landscapes of forest zones.